REMARKS

No claims have been amended and no claims have been added. Accordingly, claims 1-20 remain under prosecution in this application.

35 USC § 103

Claims 1-3, 6-8, 12-14 and 17-19 are rejected under 35 USC § 103(a) as being unpatentable over Goodman ('210) in view of Nuckolls et al ('430). The Examiner admits that Goodman does not disclose a spark gap connected in series with the diode; however, the Examiner contends that Nuckolls discloses ". . . an apparatus (Figure 2) for an inductive load 7 comprising a spark gap 3 connected in series with a diode 9." The undersigned respectfully disagrees with the Examiner's position.

Firstly, the undersigned has closely reviewed the '430 reference and nowhere can the undersigned find a teaching that load 7 is an ***inductive*** load. Moreover, quite to the contrary, column 2, lines 20 and 31 states that ". . . load 7 is a street lighting luminaire." The word "inductive" is never used to characterize "street lighting luminaire." Accordingly, it is improper for the Examiner to combine the '430 reference with the '210 reference because there is no motivation to combine a non-inductive load circuit (i.e. '430 reference) with an inductive load circuit (i.e. the '210 reference).

Moreover, even assuming for the sake of argument, that there is motivation to combine the '210 reference with the '430 reference, the combination of references still falls short of the claimed invention. Specifically, independent apparatus claim 1 and independent method claim 12 both refer to a "spark gap." A "spark gap" is a term of art used in electronics to refer to the arrangement of two electrodes between which a ***disruptive discharge*** of electricity may occur and such that the insulation is self-restoring after the passage of a discharge (see enclosed page 551 from the Radio Shack Dictionary of Electronics, 4th Edition, Second Printing, Copyright 1974). The device 3 referred to by the Examiner as a "spark gap" is not referred to as a "spark gap" in the '430 patent and does not function as a "spark gap" as defined in the above-referenced Radio Shack definition. Close review of the '430 patent shows that element 3 is a gas tube which is responsive to selected radiation (e.g. ambient light). Incident tight, causes photo-

emission of electronics from the cathode of the tube, resulting in current flow through the tube (see generally column 2, lines 34-39). The '430 reference states that gas tubes are also known as "glow lamps." Enclosed herewith are pages 248, 423 and 425 from the above-referenced Radio Shack Dictionary wherein glow lamp, photoelectric current, and phototube are defined respectively. None of these device operate even remotely similarly to a spark gap. A phototube (which is synonymous to the "gas tube" as disclosed in the '430 patent) is a form of a switch which is activated via a selected radiation (i.e. incident light). It does not operate in the realm of a "disruptive discharge" as does as spark gap. A fair reading of the '210 patent in conjunction with the '430 patent might suggest to one skilled in the art that a phototube could be placed in series with a diode but there is no teaching or suggestion to place a spark gap (i.e. disruptive discharge) device in series with the diode.

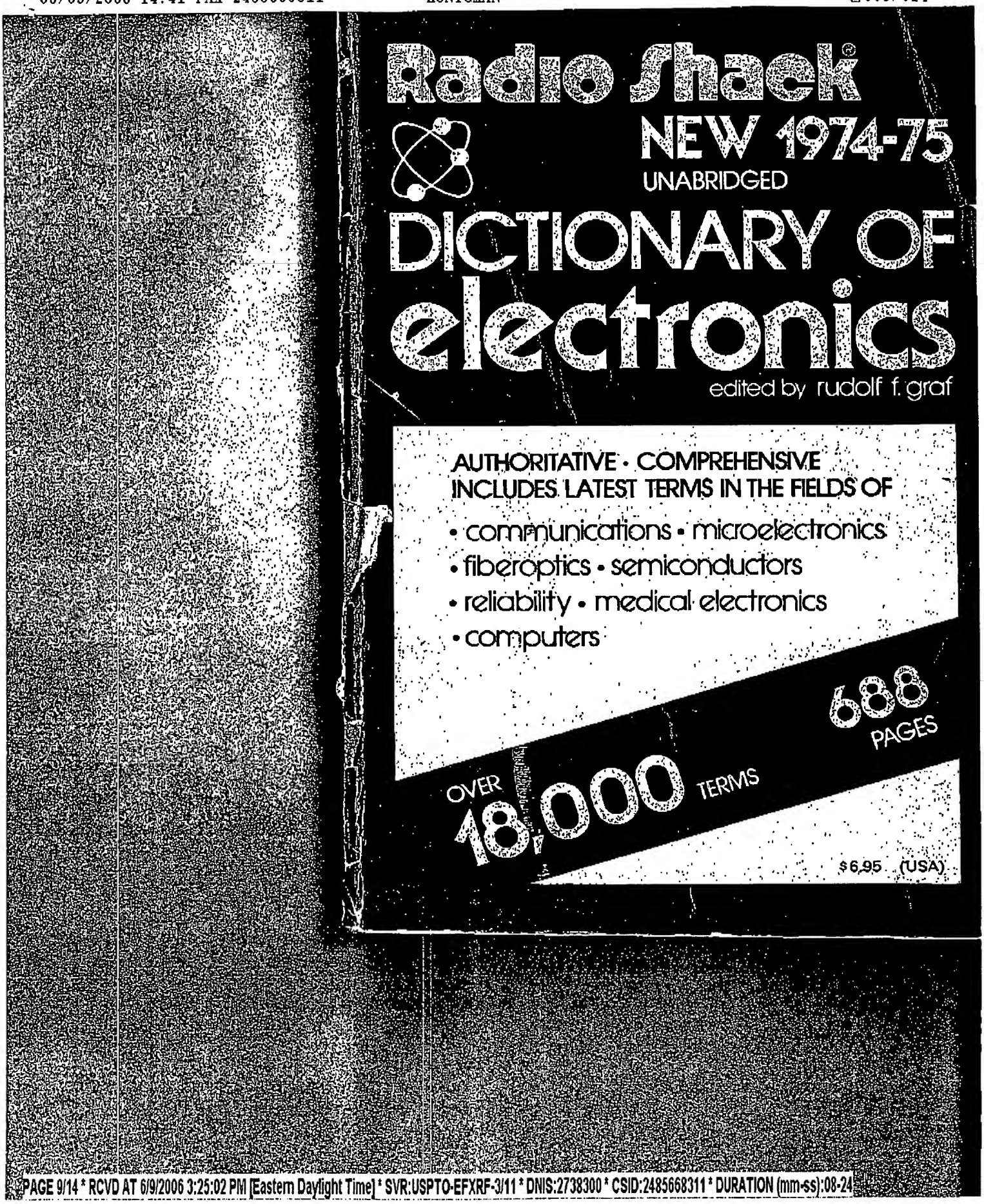
For the reasons set forth above, the undersigned believes that all claims of record are in condition for allowance.

Any fee due with the filing of this paper is identified in the attached Amendment Transmittal. However, if any additional fee is due, please charge our Deposit Account No. 50-3145, under Order No. 90040-104774 from which the undersigned is authorized to draw.

Dated: 6/9/2006

Respectfully submitted,

By _____
Joseph V. Coppola, Sr.
Registration No.: 33,373
HONIGMAN MILLER SCHWARTZ AND COHN LLP
38500 Woodward Avenue
Suite 100
Bloomfield Hills, Michigan 48304-5048
(248) 566-8500
Attorney for Applicant



FOURTH EDITION

SECOND PRINTING—1974

space phase—Reaching corresponding peak values at the same point in space.

space quadrature—The difference in the position of corresponding points of a wave in space, the points being separated by one quarter of the wavelength in question.

spacer cable—A means of primary power distribution that consists of three partially insulated or covered phase wires and a high-strength messenger-ground wire, all mounted in plastic or ceramic insulating spacers.

space-to-mark transition—The transition, or switching, from a spacing impulse to a marking impulse. (Teletypewriter term.)

space wave—The radiated energy consisting of the direct and ground waves.

spacing—The distance between stereo microphones or speakers.

spacing end distortion — End distortion which lengthens the spacing impulse by advancing the mark-to-space transition. (Teletypewriter term.)

spacing interval—The interval between successive telegraph signal pulses. During this interval, either no current flows or the current has the opposite polarity from that of the signal pulses.

spacing pulse—In teletypewriter operation, the signal interval during which the selector unit does not operate.

spacing wave—Also called back wave. In telegraphic communication, the emission which takes place between the active portions of the code characters or while no code characters are being transmitted.

spacistor—A semiconductor device consisting of one pn junction and four electrode connections. It is characterized by a low transient time for carriers to flow from the input to the output.

spade bolt—A bolt with a threaded section and one spade-shaped flat end through which there is a hole for a screw or rivet. It is used for fastening shielded coils, capacitors, and other components to the chassis.

spade contact—A contact with fork-shaped female members designed to dovetail with spade-shaped male members. Alignment in this type of connection is very critical if good conductivity is to be achieved.

spade tips—Notched, flat metal strips connected to the end of a cord or wire so that it can be fastened under a binding screw.

spade-tongue terminal — A slotted-tongue terminal designed to be slipped around a screw or stud without removal of the nut.

spaghetti — Heavily varnished cloth tubing sometimes used to provide insulation for circuit wiring.

span—1. The part or space between two consecutive points of support in a conductor, cable, suspension strand, or pole line. 2. The reach or spread between two established limits such as the difference between high and low values in a given range of physical measurements.

spark—1. The abrupt, brilliant phenomenon which characterizes a disruptive discharge. 2. A single, short electrical discharge between two electrodes.

spark capacitor — A capacitor connected across a pair of contact points, or across the inductance which causes the spark, for the purpose of diminishing sparking at these points.

spark coil—An induction coil used to produce spark discharges.

spark frequency—The total number of sparks occurring per second in a spark transmitter (not the frequency of the individual waves).

spark gap—The arrangement of two electrodes between which a disruptive discharge of electricity may occur, and such that the insulation is self-restoring after the passage of a discharge.

spark-gap modulation—Modulation in which a controlled spark-gap breakdown produces one or more pulses of energy for application to the element in which the modulation is to take place.

spark-gap modulator — A modulator employed in certain radar transmitters. A pulse-forming line is discharged across either a stationary or a rotary spark gap.

spark-gap oscillator — A type of oscillator consisting essentially of an interrupted high-voltage discharge and a resonant circuit.

sparking — Intentional or accidental spark discharge, as between the brushes and commutator of a rotating machine, between the contacts of a relay or switch, in a solid tantalum capacitor, or at any other point at which a circuit is broken.

sparking voltage—The minimum voltage at which a spark discharge occurs between electrodes of a given shape, at a given distance apart, under given conditions.

spark killer—An electric network, usually a capacitor and resistor in series, connected across a pair of contact points (or across the inductance which causes the spark) to diminish sparking at these points.

spark lag—The interval between attainment of the sparking voltage and passage of the spark.

sparkover—Breakdown of the air between two electrical conductors, permitting the passage of a spark.

spark plate—In an automobile radio, a metal plate insulated from the chassis by a thin sheet of mica. It bypasses the noise signals picked up by the wiring under the hood.

spark-quenching device — *See* Spark Suppressor.

spark recorder—A recorder in which the recording paper passes through a spark gap formed by a metal plate underneath and a moving metal pointer above the paper. Sparks from an induction coil pass through the paper, periodically burning small holes that form the record trace.

spark spectrum—The spectrum produced in a substance when the light from a spark passes between terminals made of that substance or through an atmosphere of that substance.

spark suppressor — Also called a spark-quenching device or an arc suppressor. An electric network, such as a capacitance and resistance in series, or a diode connected across a pair of contacts to diminish sparking (arcing) at these contacts.

spark test—A test performed on wire and cable to determine the amount of detrimental porosity or defects in the insulation.

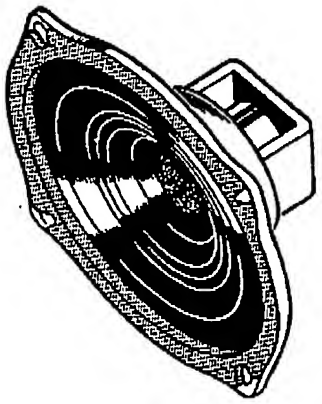
spark transmitter—A radio transmitter in which the source of radio-frequency power is the oscillatory discharge of a capacitor through an inductor and a spark gap.

spatial coherence — The phase relationship of two wave trains in space.

spatial distribution—The directional properties of a speaker, transmitting antenna, or other radiator.

spdt — Abbreviation for single-pole, double-throw.

speaker—Abbreviated spkr. Also called a loudspeaker. An electroacoustic transducer that radiates acoustic power into the air with essentially the same waveform as that of the electrical input.



Speaker.

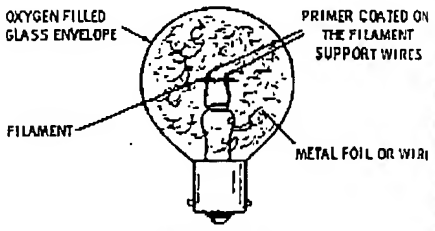
speaker efficiency—Ratio of the total useful sound radiated from a speaker at any frequency, to the electrical power applied to the voice coil.

speaker impedance—The rated impedance of the voice coil of a speaker.

speaker-reversal switch—A switch for connecting the left channel to the right speaker and vice versa on a stereo amplifier. It is a means of correcting for improper left-right orientation in the program source.

speaker system—A combination of one or more speakers and all associated baffles, horns, and dividing networks used to couple the driving electric circuit and the acoustic medium together.

current heats the metal to incandescence, and a brilliant flash of light is produced when the wire burns in the oxygen.



Photoflash bulb.

photoflash tube—*See* Flash Tube.

photoflood lamp—An incandescent lamp employing excess voltage to give brilliant illumination. Used in television and photography, it has a life of only a few hours.

photogalvanic cell—A cell which generates an electromotive force when light falls on either of the electrodes immersed in an electrolyte.

photogenerator—A semiconductor-junction device that emits light when pulsed.

photoglow tube—A gas-filled phototube used as a relay. This is done by making the operating voltage so high that ionization and a glow discharge occur, accompanied by considerable current flow, when certain illumination is reached.

photographic writing speed—A figure of merit used to describe the ability of a particular combination of camera, film, oscilloscope, and phosphor to record a high-speed trace. It expresses the maximum single-event spot velocity (usually in centimeters per microsecond) that can be recorded on film as an image just discernible to the eye.

photoionization—Ionization occurring in a gas as a result of visible light or ultraviolet radiation.

photo-island grid—A photosensitive surface in the storage-type Farnsworth dissector tube used with television cameras. It comprises a thin, finely perforated (about 400 holes per square inch) sheet of metal.

photojunction battery—A nuclear-type battery in which the radioactive material, promethium 147, irradiates a phosphor which converts nuclear energy into light. The light is then converted to electrical energy by a small silicon junction.

photoluminescence—Luminescence stimulated by visible light or ultraviolet radiation.

photomagnetic effect—The direct effect of light on the magnetic susceptibility of certain substances.

photomagnetoelectric effect—The production in a semiconductor of an electromotive force normal to both an applied magnetic field and to a photon flux of proper wavelength.

photometer—An instrument for measuring the intensity of a light source or the amount of illumination, usually by comparison with a standard light source.

photometric—Related to measurements of light.

photometry—The techniques for measuring luminous flux and related quantities (e.g., luminous intensity, illuminance, luminance, luminosity, etc.).

photomultiplier pulse-height resolution—A measure of the smallest change in the number of electrons emitted during a pulse from the photocathode that can be discerned as a change in output-pulse height.

photomultiplier tube—*See* Multiplier Phototube.

photon—A quantum of electromagnetic energy. The equation is hν, where h is Planck's constant and ν is the frequency associated with the photon.

photon-coupled isolator—A circuit-coupling device consisting of an infrared emitter diode-coupled to a photon detector over a short shielded light path, which provides extremely high circuit isolation.

photon coupling—Coupling between circuits by a beam of light.

photonegative—Having a negative photoconductivity—hence, decreasing in conductivity (increasing in resistance) under the action of light. Selenium sometimes exhibits this property.

photoparametric diode—A pill-sized device for simultaneously detecting and amplifying optical energy modulated at microwave frequencies.

photophone—A device for converting variations in light intensity into sound.

photopositive—Having a positive photoconductivity—hence, increasing in conductivity (decreasing in resistance) under the action of light. Selenium ordinarily has this property.

photorelay circuit—A form of on-off control actuated by a change of illumination.

photoresist—A solution that when exposed to ultraviolet light becomes extremely hard and resistant to etching solutions that dissolve materials such as silicon dioxide.

photoresistive or photoconductive transduction—Conversion of the measurand into a change in the resistance of a semiconductor material (by changing the illumination incident on the material).

photoresistor—A semiconductor resistor which, when illuminated, drops in resistance.

photosensitive—Capable of emitting electrons when struck by light rays.

photosensitive field-effect transistor—A special unipolar field-effect transistor (FET) structure that is positioned on a header to receive illumination transmitted through a lens in the top of the header can. It combines the circuit and device characteristics of a photodiode and a high-impedance low-noise amplifier.

photosensitive recording—Recording by the exposure of a photosensitive surface to a signal-controlled light beam or spot.

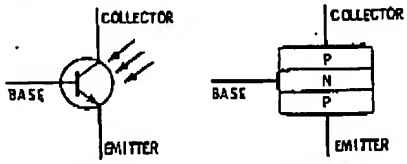
photosensitive semiconductor—A semiconductor material in which light energy controls the current-carrier movement.

photosphere—The outermost luminous layer of the gaseous body of the sun.

photoswitch—A solid-state device that functions as a high-speed power switch activated by incident radiation. *See also* LASCR *and* LASCS.

phototelegraphy—In facsimile, the process of sending photographs over a wire.

phototransistor—A junction transistor with its base exposed to light through a lens in the housing. The collector current increases as the light intensity increases, because of the amplification of the base current by the transistor structure. The device may have only collector and emitter leads, or it may also have a base lead.



Phototransistor.

phototube—Also called photoelectric tube. An electron tube containing a photocathode. Its output depends on the total photoelectric emission from the irradiated area of the photocathode.

phototube bridge circuit—A circuit in which a phototube is one arm of a bridge circuit. With such a circuit, a balanced condition (no signal output) can be reached under either a black-signal or white-signal condition, depending on the impedance adjustments in the other arms.

phototube relay—An electrical relay in which the action of a beam of light on a phototube operates mechanical devices such as counters and safety controls.

photovaristor—A varistor in which the current-voltage relation may be modified by illumination. Cadmium sulphide and lead telluride exhibit such properties.

photovoltaic—Capable of generating a voltage when exposed to visible or other light radiation.

photovoltaic cell—A self-generating semiconductor device which converts light into electrical energy (illustration, page 426).

photovoltaic converter—A device for converting light to electric energy by means of the photovoltaic effect.

photovoltaic effect—The generation of a voltage (or an electric field) in a material that is illuminated with radiation of a suitable wavelength.

ment at a color temperature of 2870°K when the flux is filtered by a specified blue filter.

photocathode luminous sensitivity — The quotient of photoelectric emission current from the photocathode divided by the incident luminous flux. The measurement is made under specified conditions of illumination, usually with radiation from a tungsten-filament lamp operated at a color temperature of 2870°K. The cathode is usually illuminated by a collimated beam at normal incidence.

photocathode radiant sensitivity—The quotient of the photoelectric emission current from the photocathode divided by the incident radiant flux. It is usually measured at a given wavelength under specified conditions of irradiation with a collimated beam at normal incidence.

photocell—*See* Photoelectric Cell.

photochromic—Pertaining to a single-crystal inorganic material used as a display and storage element. The material can be from one of several families of materials, such as fluorides or titanates. The display color and storage time are determined by the amount and kind of doping of the material.

photoconductive cell—A photoelectric cell, the electrical resistance of which varies inversely with the intensity of light that strikes its active material.

photoconductive effect—The change of electrical conductivity of a material when exposed to varying amounts of radiation.

photoconductive material—Material having a high resistance in the dark, and a low resistance when exposed to the light.

photoconductivity — The greater electrical conductivity shown by some solids when illuminated. The incoming radiation transfers energy to an electron, which then takes on a new energy level (in the conduction band) and contributes to the electrical conductivity.

photoconductor—A passive, high-impedance device composed of thin single-crystal or polycrystalline films of compound semiconductor materials. When the sensitive surface is illuminated its resistance decreases and hence its conductivity increases.

photodetector—A device that senses incident illumination.

photodielectric effect — The change in the dielectric constant and loss of a material when illuminated. The effect is observed only in phosphors that show photoconductivity during luminescence.

photodiffusion effect—*See* Dember Effect.

photodiode—A solid-state device similar to an ordinary diode with the exception that light incident on the pn junction causes the device to conduct. Ideally, the photodiode behaves as an open circuit in the dark.

photoelasticity—Changes in the optical properties of transparent isotropic dielectrics subject to stress.

photoelectric—Pertaining to the electrical effects of light or other radiation—i.e., emission of electrons, generation of a voltage, or a change in electrical resistance upon exposure to light.

photoelectric absorption—Conversion of radiant energy into photoelectric emission.

photoelectric cathode—A cathode the primary function of which is photoelectric emission.

photoelectric cell—Also called photocell. A cell, such as a photovoltaic or photoconductive cell, the electrical properties of which are affected by illumination. The term should not be used for a phototube, which is a vacuum tube and not a cell.

photoelectric colorimeter — A colorimeter which uses a photoelectric cell and a set of color filters to determine, by the output current for each filter, the chromaticity coordinates of light of a given sample.

photoelectric conductivity — The increased conductivity exhibited by certain crystals when struck by light (e.g., a selenium cell).

photoelectric constant — A quantity which, when multiplied by the frequency of the radiation causing the emission, gives (in centimeter-gram-second units) the voltage absorbed by the escaping photoelectron. The constant is equal to h/e, where h is Planck's constant and e is the electronic charge.

photoelectric control — The control of a circuit or piece of equipment in response to a change in incident light impinging on a photosensitive device.

photoelectric counter—A device that registers a count whenever an object breaks the light beam shining on its phototube or photocell. An amplifier then boosts the minute energy to register on a mechanical or other type of counter.

photoelectric current—The stream of electrons emitted from the cathode of a phototube under the influence of light.

photoelectric cutoff control—A photorelay circuit used in machines for cutting long strips of paper, cloth, metal, or other material accurately into predetermined lengths or at predetermined positions.

photoelectric effect—The transfer of energy from incident radiation to electrons in a substance. This phenomenon includes photoelectric emission of electrons from the surface of a metal, the photovoltaic effect, and photoconductivity.

photoelectric electron-multiplier tube — A vacuum phototube that employs secondary emissions to amplify the electron stream emitted from the illuminated photocathode.

photoelectric emission — Electron emission due directly to the incidence of radiant energy on the emitter.

photoelectric flame-failure detector — An industrial electronic control employing a phototube and amplifier to actuate an electromagnetic or other valve that cuts off the fuel flow when the fuel-consuming flame is extinguished and light no longer falls on the phototube.

photoelectric inspection—Quality control of a product by means of a phototube, light-beam system, and associated electronic equipment.

photoelectric intrusion detector—A burglar-alarm system in which interruption of a light beam by an intruder reduces the illumination on a phototube and thereby closes an alarm circuit.

photoelectric liquid-level indicator—A level indicator in which the rising liquid interrupts the beam of light in a photoelectric control system.

photoelectric material—Any material that will emit electrons when illuminated in a vacuum (e.g., barium, cesium, lithium, potassium, rubidium, sodium, and strontium).

photoelectric phonograph pickup—A phonograph reproducing device consisting essentially of a light source, a jewel stylus to which a very thin mirror is attached, and a selenium cell that picks up light reflected from the mirror. Sidewise movements of the stylus in the record groove cause the amount of reflected light to vary, and accordingly the resistance of the selenium cell. The light source is fed by a radio-frequency oscillator rather than from the power line, to eliminate 60-hertz flicker from the light beam.

photoelectric photometer — A photometer which incorporates a phototube or photoelectric cell for measurements of light.

photoelectric pickup — A transducer that transforms a change in light into an electric signal.

photoelectric pyrometer—An instrument for measuring high temperatures from the intensity of the light given off by the heated object.

photoelectric reader—A device that reads information stored in the form of holes punched in paper tape or cards, by sensing light passed through the holes.

photoelectric recorder—An optical recording instrument employing a light source and phototube for the basic measuring element.

photoelectric register control — A photoelectric device used for controlling the position of a strip of paper, cloth, metal, etc., with respect to the machine through which it is being passed.

photoelectric relay—Also called light relay. A relay combined with a phototube (and amplifier if necessary), so arranged that changes in incident light on the phototube cause the relay contacts to open or close.

photoelectric scanner—A light source, lens system, and one or more phototubes in a single, compact housing. It is mounted a few inches above a moving surface, where it actuates control equipment when the amount of light reflected from the surface changes.

photoelectric sensitivity—Also called photoelectric yield. The rate at which electrons

glide-slope facility—A radio transmitting facility which provides the glide-slope signals.

G-line—A round wire coated with a dielectric and used to transmit microwave energy.

glint—1. Also called glitter. A distorted radar-signal echo, which varies in amplitude from pulse to pulse because the beam is being reflected from a rapidly moving object such as an airplane propeller. 2. An electronic-countermeasures technique in which the scintillating, or flashing, effect of shuttered or rotating reflectors is used to degrade the tracking or seeking functions of an enemy weapons system.

glissando—A tone that changes smoothly from one pitch to another.

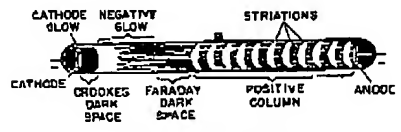
glitch—A form of low-frequency interference appearing as a narrow horizontal bar moving vertically through the television picture. This is also observed on an oscilloscope at the field or frame rate as an extraneous voltage pip moving along the signal at approximately the reference-black level.

glitter—*See* Glint.

glossmeter—A photoelectric instrument for determining the gloss factor of a surface (i.e., the ratio of light reflected in one direction to the light reflected in all directions).

glow discharge—A discharge of electricity through a gas in an electron tube. It is characterized by a cathode glow resulting from a space potential much higher than the ionization potential of the gas in the vicinity of the cathode.

glow-discharge microphone—A microphone in which the sound waves cause corresponding variations in the current forming a glow discharge between two electrodes.



Glow-discharge tube.

glow-discharge tube—A gas tube that depends for its operation on the properties of a glow discharge.

glow-discharge voltage regulator—A gas tube used for voltage regulation. The resistance of the gas within the tube varies in step with the voltage applied across the tube.

glow lamp—A lamp containing a small amount of gas or vapor. Current between the two electrodes ionizes the gas and causes the lamp to glow but does not provide rectification. Neon gives a red-orange glow, mercury vapor a blue glow, and argon a purple glow.

glow potential—The voltage at which a glow discharge begins in a gas-filled electronic tube as the voltage is gradually increased.

glow switch—An electron tube used in some fluorescent-lamp circuits. It contains two bimetal strips which are closed when heated by the glow discharge.

glow-tube rectifier—Also called a point-plane rectifier. A cold-cathode gas-discharge tube which provides a unidirectional current flow.

glue-line heating—An arrangement of electrodes designed to heat a thin film of material having a high loss factor between alternate layers of materials having a low loss factor.

g_m—Symbol for the mutual conductance or transconductance of a vacuum tube.

G-M counter—Abbreviation for Geiger-Mueller counter.

G – Y signal—In color television, the green-minus-luminance signal representing primary green minus the luminance, or Y, signal. It is combined with a luminance, or Y, signal outside or inside the picture tube to yield a primary green signal.

GMT (or Gmt)—Abbreviation for Greenwich mean time.

gobo—A dark mat used to shield the lens of a television camera from stray lights.

gold-bonded diode—A semiconductor diode in which a preformed whisker of gold contacts an n-germanium substrate as the junction is formed by millisecond electrical pulses.

gold doping—A technique used to control the lifetime of minority carriers in a diffused-mesa transistor. Gold is diffused into the base and collector regions to reduce the storage time.

gold-leaf electroscope—An apparatus comprising two pieces of gold leaf joined at their upper ends and suspended inside a glass jar. When a charge is applied to the terminal connected to the leaves, they spread apart due to repulsion of the like charges on them.

Goldschmidt alternator—An early radio transmitter. It is a rotating machine employing oscillating circuits in connection with the field and the armature to introduce harmonics in the generated fundamental frequency. Interaction between the stator and rotor harmonics gives a cumulative effect and thereby provides very high radio frequencies.

goniometer—1. In a radio-range system, a device for electrically shifting the directional characteristics of an antenna. 2. An electrical device for determining the azimuth of a received signal by combining the outputs of individual elements of an antenna array in certain phase relationships.

googol—In mathematics, the figure 1 followed by 100 zeros.

goto circuit—A circuit capable of sensing the direction of current. It can be used in majority logic circuits in which the output is either positive or negative, depending on whether the majority of its inputs is positive or negative.

goto pair—Two tunnel diodes connected in series in a way such that one is in the reverse tunneling region when the other is in the forward conduction region. This arrangement is used in high-speed gate circuits.

governed series motor—A motor used with teletypewriter equipment. It has a governor for regulating the speed.

governor—1. A motor attachment that automatically controls the speed at which the motor rotates. 2. The equipment which controls the gate or valve opening of a prime mover.

gpi—Abbreviation for ground-position indicator.

graceful degradation—A computer programming technique the purpose of which is to prevent catastrophic system failure by permitting the machine to operate, although in a degraded mode, in spite of failures or malfunctions in several integral units or subsystems.

graded-base transistor—*See* Diffused-Base Transistor.

graded filter—A power-supply filter in which the output stage of a receiver or audio amplifier is connected at or near the filter input so that the maximum available dc voltage will be obtained. The output stage has low gain; therefore, ripple is not too important.

graded insulation—A combination of insulations proportioned so as to improve the distribution of the electric field to which the combination is subjected.

graded-junction transistor—*See* Rate-Grown Transistor.

graded thermoelectric arm—A thermoelectric arm having a composition that changes continuously in the direction of the current.

gradient—The rate at which a variable quantity increases or decreases. For example, potential gradient is the difference of potential along a conductor or through a dielectric.

gradient meter—*See* Generating Electric Field Meter.

gradient microphone—A microphone in which the output rises and falls with the sound pressure. (*See also* Pressure Microphone.)

gram—A unit of mass and weight in the metric system.

gramme ring—A ring-shaped iron armature around which the coils are wound. Each turn is tapped from the inside diameter of the ring to a commutator segment.

grandfather cycle—The period during which magnetic-tape records are retained before using so that records can be reconstructed in the event of loss of information stored on magnetic tape.

granular carbon—Small particles of carbon used in carbon microphones.

granularity—A characteristic of the output data of a measuring instrument. The measure of granularity is the smallest increment of the output data when it is in a digital